Random-Shaped Image Inpainting using Dilated Convolution

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Abstract

Over the past few years, Deep learning-based methods have shown encouraging and inspiring results for one of the most complex tasks of computer vision and image processing; Image Inpainting. The difficulty of image inpainting is derived from itsô need to fully and deeply understand of the structure and texture of images for producing accurate and visibly plausible results especially for the cases of inpainting a relatively larger region. Deep learning methods usually employ convolution neural network (CNN) for processing and analyzing images using filters that consider all image pixels as valid ones and usually use the mean value to substitute the missing pixels. This result in artifacts and blurry inpainted regions inconsistent with the rest of the image. In this paper, a new novel-based method is proposed for image inpainting of random-shaped missing regions with variable size and arbitrary locations across the image. We employed the use of dilated convolutions for composing multiscale context information without any loss in resolution as well as including a modification mask step after each convolution operation. The proposed method also includes a global discriminator that also considers the scale of patches as well as the whole image. The global discriminator is responsible for capturing local continuity of images texture as well as the overall global imagesô features. The performance of the proposed method is evaluated using two datasets (Places2 and Paris Street View). Also, a comparison with the recent state-of-the-art is preformed to demonstrate and prove the effectiveness of our model in both qualitative and quantitative evaluations.

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